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Aids to  
Employment Managers and Interviewers

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# Shipyard Occupations

WITH

DESCRIPTION OF SUCH OCCUPATIONS

SPECIAL BULLETIN

SERIES ON

EMPLOYMENT MANAGEMENT  
IN THE SHIPYARD

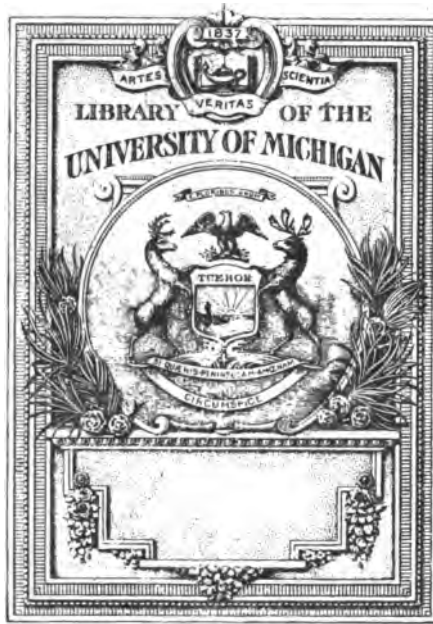


EMPLOYMENT MANAGEMENT BRANCH  
INDUSTRIAL SERVICE SECTION  
INDUSTRIAL RELATIONS GROUP

UNITED STATES SHIPPING BOARD EMERGENCY FLEET CORPORATION

PHILADELPHIA

1919



THE GIFT OF  
U.S. Shipping Board

112

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**PHILADELPHIA**

**1918**

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***It is more economical and more expedient to spend five or even ten minutes in properly placing the new worker than it is to spend two hours or sometimes two days in trying to replace him.***

Rec 1955 11-30-34 24472-

U.S. Navy Dept. of the Navy

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## INTRODUCTION

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This hand-book on shipyard occupations, with description of such occupations and suggestions on same for employment managers and interviewers, has been prepared to aid employment managers and interviewers in selecting workers and in adjusting them to their jobs. It is expected, also, that this book will be used by foremen in making requisitions for help and assisting the workers.

All the fundamental trades and occupations are listed, with the most commonly accepted names used as a standard. Names and methods peculiar to certain localities have not been mentioned.

These specifications describe the occupation from the shipyard standpoint. It is not expected that each applicant or worker will possess all the stated qualifications, but the data given will enable the interviewer to base his judgment more specifically on exact requirements.

It is hoped that this hand-book will be used by all shipyards, in order that occupational names may be standardized and a uniform basis for the selection and classification of shipyard workers be established in employment procedure.

The statements as to entrance requirements for training school and physical qualifications are tentative, as the standards of requirements will vary in different yards.

A supplement will be issued covering the shipyard occupations in which handicapped persons of various types can be employed.

*Philadelphia,*  
*July, 1918.*





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## INDEX TO ALLIED OCCUPATIONS

This is a cross-index designed to indicate to interviewers the allied occupations from which workers may be drawn for shipyard work, and the shipyard occupations for which they should be best fitted on the basis of their previous experience.

For example, an interviewer desiring to hire "Anglesmiths" and having none applying, can readily see at a glance that he may consider "Architectural Iron Workers," "Blacksmiths," etc., as the index indicates, as material from which it may be possible to draw.

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## **SUPERVISORS**

### **FOREMAN:**

The Foreman usually has under his jurisdiction groups of men, generally working in different occupations, each group having its own leader. He should be a man who understands the requirements of the occupations of these various groups. He should be able to handle men in such a manner as to maintain the maximum production. He must be tactful, resourceful, confident and able to co-ordinate the work of the different groups in his department.

### **QUARTERMAN:**

Quartermen is a term now coming into general use. It is generally applied to a man having under his supervision more than one group in the same occupation. He must be thoroughly familiar with the requirements of the occupation of which he is in charge and capable of directing the work and maintaining maximum production. He is likely material for promotion to the position of Foreman.

### **LEADING MAN:**

This term is generally applied to a man having only a few men in the same occupation under his leadership. He is also known as a group leader or a gang boss. He must be thoroughly familiar with the requirements of the occupation and also able to direct the activities of others and to maintain maximum production. He is likely material for promotion to the position of Quartermen.

### **GANG BOSS:**

See Leading Man.

## ANGLESMITH

### OTHER NAMES BY WHICH OCCUPATION IS KNOWN:

Frame Bender.

### OCCUPATIONS MOST NEARLY ALLIED:

Blacksmith, Toolsmith, Furnaceman, Architectural Ironworker.

### TRADE REQUIREMENTS:

The Anglesmith uses templates furnished by the mold loft or lifted from the ship by shipfitters to bend and weld light lengths and angular shapes, such as tank frames, door frames, frame staples, bulkhead staples, etc. He should be a smith, possessing skill in bending and welding angular work. He should be acquainted with proper temperatures for working, and understand in a practical way, the action of shapes and plates when heated and cooled, so as to make proper allowances for shrinkage and change of the shape when cooling. On the light work he must work rapidly because the light weight angles cool more quickly than the solid bars to which a blacksmith is accustomed. The Anglesmith is usually assisted by two or more helpers, as the work in hand may require.

### EDUCATION:

Common school education is of value in this occupation, but not absolutely necessary.

### PHYSICAL REQUIREMENTS:

Strength, endurance, quickness, good eyesight, and ability to stand intense heat.

### MENTAL REQUIREMENTS:

Average intelligence.

### EXPERIENCE:

The Anglesmith is a highly trained workman. Several years of experience are necessary to acquire an expert knowledge of the working and heating of steel shapes and plates. Experience in use of coal, coke, gas or oil furnaces is essential. Recruits from the allied trades would require about six months' training to become proficient in anglesmith work.

### ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:

A candidate for this school should be a young man, preferably over eighteen years of age, of robust build, average strength and endurance, fair intelligence.

### RATE ESTABLISHED:

## **BACK-HANDLER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Helper, Back Hander.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Blacksmith's Helper, Forge Shop Helper, Anglesmith's Helper.

### **TRADE REQUIREMENTS:**

The Back-handler helps manipulate the stock on the press or hammer at the direction of the forger or the one in charge.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance; ability to stand intense heat.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

None necessary. Work is performed under the direction of the one in charge of his group.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**



## **BITUMASTIC PAINTER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Coating Applier.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Cementer, Rough Painter, Slag Roofer, Tar Roofer.

### **TRADE REQUIREMENTS:**

The Bitumastic Painter works around tanks, bulkheads, or other watertight compartments, and wherever required applies bituminous or anti-corrosive composition. The work is disagreeable.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The average laborer can be trained to become proficient in this work in about two weeks.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **BLACKSMITH**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Anglesmith, Hammersmith, Toolsmith, Shipsmith, Horseshoer,  
Forger (Liner).

### **TRADE REQUIREMENTS:**

A Blacksmith must be capable of doing welding, and able to make all kinds of medium or light machine and hand forgings from drawings, templates, or samples; should be familiar with coal, coke, gas and oil furnaces; have some experience on steam or power hammers; have a good knowledge of heat treatment of steel, including oil and water tempering and hardening.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance; good eyesight, as a Blacksmith's duties require him to be looking into forges or furnaces constantly.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Should have served as an apprentice in general blacksmith shop.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common or high school education; should have good health, strength, and be of robust stature.

### **RATE ESTABLISHED:**

## **BOAT BUILDER—(Steel)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Sheet Metal Worker, Automobile Body Builder, Steel Car Builder, Airplane and Hydroplane Body Builder.

### **TRADE REQUIREMENTS:**

The Steel Boat Builder is experienced in the details, construction, fitting up, and repairing of all kinds of small steel boats, pontoons and floats. He applies the technique of sheet metal worker to the construction of small boats. He should have experience in bending frames, laying deck, setting frames, etc.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Should be able to read blue prints; have a knowledge of templates and drawings; knowledge of timbers, bracing and framing. He should understand the use of the blow torch and be able to solder; should have served an apprenticeship or equivalent with a steel boat builder. A sheet metal worker would need about a year's experience in a boat shop before he could become a boat builder.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average physique.

### **RATE ESTABLISHED:**

## **BOAT BUILDER—(Wood)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Boat Carpenter, Ship Carpenter.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Automobile Body Builder, Wood Car Builder, Carpenter, Cabinetmaker, Joiner, Patternmaker.

### **TRADE REQUIREMENTS:**

A Wood Boat Builder is experienced in the details, construction, fitting up, and repairing of all classes of small wood and canvas-covered boats; expert in the use of carpenter's and joiner's tools.

### **EDUCATION:**

Common school education; ability to read blue prints and mechanical drawings; knowledge of templates, and also of timbers, bracing and framing.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience as an assistant or helper to a ship carpenter or ship-joiner would be valuable. A cabinetmaker or joiner will require about one year's experience to become efficient as a boat builder.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average physique.

### **RATE ESTABLISHED:**

## **BOILER INSPECTOR**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Boilermaker Foreman, Boilermaker. .

### **TRADE REQUIREMENTS:**

The Boiler Inspector must be experienced in the details of boiler construction, repairs, and maintenance; thoroughly familiar with the rules and requirements of the Interstate Commerce Commission, American Society of Mechanical Engineers, and the various public service commissions in connection with the maintenance and inspection of boilers. He must be familiar with the various tests incidental to boiler work, and the proper methods of applying them; able to investigate boiler accidents and their causes, to detect improper conditions by visual examination, and loose or broken stay-bolts or boiler-stays by hammer test.

### **EDUCATION:**

Common, trade, technical school.

### **PHYSICAL REQUIREMENTS:**

Good eyesight and hearing; medium stature and build. An Inspector is obliged at times to work in cramped and close quarters, where a man of medium stature and build could work to best advantage.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Should have had experience as practical boilermaker; be able to read and interpret blue prints and mechanical drawings.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school or trade school; first-class boilermaker; good eyesight and hearing.

### **RATE ESTABLISHED:**

## **BOILER LAYOUT MAN**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Boiler Inspector, Boilermaker.

### **TRADE REQUIREMENTS:**

The Boiler Layout Man should be able to calculate and lay out from drawings all the details of boiler construction.

### **EDUCATION:**

Common school, trade school.

### **PHYSICAL REQUIREMENTS:**

Average physique; good eyesight.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Should have experience as a practical boilermaker—knowledge of the trade, methods, tools, etc.; ability to read and interpret blue prints and mechanical drawings. Knowledge of applied mathematics, including geometry, is desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average physique; first-class boiler-maker.

### **RATE ESTABLISHED:**

## **BOILERMAKER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Tank Builder.

### **TRADE REQUIREMENTS:**

The Boilermaker erects, maintains and repairs boilers of all types and their appurtenances.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Boilermaker must be experienced in flanging and bending plates, punching, shearing, riveting, chipping, calking, patching, tube setting, and the application of stay-bolts and various types of boiler stays. In smaller shops, where specialists are not employed, experience as oxy-acetylene cutter and welder is desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average physique.

### **RATE ESTABLISHED:**

## **BOILERMAKER FOREMAN**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Tank Builder Foreman.

### **TRADE REQUIREMENTS:**

The Boilermaker Foreman supervises the lay-out, construction, repair, and maintenance of boilers and their appurtenances.

### **EDUCATION:**

Common school, trade school.

### **PHYSICAL REQUIREMENTS:**

Average physique; good eyesight, good hearing.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

He should have had experience as journeyman boilermaker; be able to read and interpret blue prints and mechanical drawings; have a knowledge of templates; and be thoroughly familiar with standard American Society Mechanical Engineers' rules, also the rules and requirements of the Interstate Commerce Commission and the Public Service rules of the state in which he happens to be located; competent to oversee the application of the different tests incidental to this work, and familiar with all types of autogenous welding.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average physique; first-class boiler-maker.

### **RATE ESTABLISHED:**



## **BOLTER-UP**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Bolter.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Machinist's Helper, Boilermaker's Helper, Regulator.

### **TRADE REQUIREMENTS:**

The Bolter-up fastens the plates, beams, etc., in place on the vessel, so that they may be reamed and riveted. Two Bolters-up usually work together—one with a maul and drift-pin, the other applying the fastening bolts.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and endurance; agility.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Bolter-up is usually recruited from the more agile and alert helpers or laborers in the shipyard. It requires several weeks to become an efficient Bolter-up.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence; ordinary physique; not under 18 years of age.

### **RATE ESTABLISHED:**

## **BOLTMAKER—(Bolt-Making Machine Operator)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Rivetmaker, Blacksmith's or Toolsmith's Helper.

### **TRADE REQUIREMENTS:**

The Boltmaker operates a bolt-making machine, which automatically forms the bolt heads, and cuts the iron to the right lengths. He operates the machine while his helper prepares the rod in the furnace.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Boltmakers are usually recruited from blacksmiths', tool-smiths' and machinists' helpers. It requires two to three weeks' training for such helpers to become efficient boltmakers.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **BUFFER AND POLISHER—(Metal)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Metal Finisher.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Grinder, Lathe Hand, Machinist's Helper.

### **TRADE REQUIREMENTS:**

Buffers and Polishers file, scrape, and work down to a smooth finish metal castings, forgings, and machined pieces; also prepare metals for plating.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average physique and strength; freedom from diseases of nose, throat and lungs.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Should have experience as grinder or mechanic's helper.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **BULLDOZER OPERATOR**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Offsetting Machine Operator, Joggling Machine Operator, Cold Press Operator.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Machine Operator in fabricating shop.

### **TRADE REQUIREMENTS:**

The Bulldozer Operator operates a machine which is used to bend, or place offsets, jogs or flanges in plates or iron shapes. This may be done by either the hot or cold presses.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength; ability to stand heat.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be familiar with hydraulic presses, able to tell when press is working properly, and able to gauge work; experience in a shell or manufacturing plant or as a wheel presser in locomotive works would be beneficial. He should also understand the operation of coal, coke, gas or oil furnaces. The more experienced pressmen are used to operate the presses on which the more complicated work is done.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **BULL RIVETER OPERATOR**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Hydraulic Riveter.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Riveter, Punch Press Man, Boilermaker, Hydraulic Press Operator.

### **TRADE REQUIREMENTS:**

The Bull Riveter Operator operates a hydraulic or pneumatic riveting machine.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He should be a first-class riveter and have experience with hydraulic machines.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

First-class riveter; common school education; strength and endurance.

### **RATE ESTABLISHED:**

## **CALKER—(Metal)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Chipper and Calker.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Chipper.

### **TRADE REQUIREMENTS:**

The Calker jams or drives down the edge of projecting angles, seams and rivets in order to make parts watertight; makes the structural part of the ship watertight by expanding the plates at the point of contact with a calking tool, which is similar to a blunt chisel. He should be able to do hand calking where air tools cannot be used conveniently.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance necessary to resist the severe strain of the work. A robust worker is usually sought. Calker works with goggles to protect the eyes from flying pieces of metal.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Calker is usually recruited from the helpers. It requires about one month for a helper to become an expert calker. In most shipyards the occupations of chipper and calker are combined, and the worker is hired only when he is capable of performing both operations.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

**CALKER—(Wood)**  
**(Steel and Wood Ships)**

**OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

**OCCUPATIONS MOST NEARLY ALLIED:**

Ship Carpenter's Helper, Wood Reamer.

**TRADE REQUIREMENTS:**

Calking and reaming are usually combined as an occupation. The Wood Calker fills in seams in the planking in the hull to make them watertight, using cotton, oakum, rosin, white lead, putty, tar or pitch, as the circumstances demand. He is sometimes assisted by an oakum spinner and a wood reamer.

**EDUCATION:**

Common school, or none.

**PHYSICAL REQUIREMENTS:**

Average strength.

**MENTAL REQUIREMENTS:**

Average intelligence.

**EXPERIENCE:**

Any intelligent workman, who has used a hammer, or mallet, can learn the details of calking in about one month; must be familiar with the use of the air hammer.

**ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence.

**RATE ESTABLISHED:**

## **CEMENTER—(Bitumastic Worker)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Cement Layer, Cement Finisher, Deck Layer.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Mason, Plasterer, Rough Painter, Concrete Worker, Lagging Applier.

### **TRADE REQUIREMENTS:**

The Cementer lays cement mixtures on the decks of ships and inner bottoms of tanks, waterways, etc., or any joints which are desired to be made watertight. He uses a trowel, and must be capable of preparing the proper mixtures.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Fair strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Cementer is usually recruited from the laborers. He is familiar with the preparation and application of cement mixtures. One month's time is required to become proficient in this work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average physique; fair intelligence.

### **RATE ESTABLISHED:**



## **CHIPPER—(Foundry)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Chipper and Grinder.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Chipper and Calker.

### **TRADE REQUIREMENTS:**

The Foundry Chipper cuts, trims, grinds or files edges and projections from castings in the foundry.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

An ordinary foundry laborer can be assigned to this work. No previous experience is necessary.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average physique; average intelligence.

### **RATE ESTABLISHED:**

## **CHIPPER—(Metal)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Chipper and Calker.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Metal Calker, Foundry Chipper, Machinist's or Boilermaker's Helper.

### **TRADE REQUIREMENTS:**

The Chipper is expert in the use of the pneumatic hammer. He cuts, trims and files castings; cuts, scarfs and flushes rivets; cuts out condemned rivets. He is able to do hand work where air tools cannot be used conveniently.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance; capable of resisting strain of the work. A robust worker is generally sought. Good eyesight is necessary. The Chipper should work with goggles.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Chipper is usually recruited from the muscular helpers or laborers in the shipyard. It requires about two months' experience to become a chipper. In most shipyards, the occupations of chipper and calker are combined, and the worker is hired only when he is capable of performing both operations.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; robust physique; average intelligence.

### **RATE ESTABLISHED:**

## **COPPERSMITH**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Sheet Metal Worker, Tinsmith.

### **TRADE REQUIREMENTS:**

The Coppersmith works from drawings, sketches, samples and templates; constructing from sheet-copper and brass, pipes of various sizes, also copper fittings to be used in the construction of the ship. He operates brazing furnaces, tins the interior of copper pipes, and solders.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Coppersmith is a highly trained workman. Several years of experience are required to become an expert in the fabrication of copper equipment.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average intelligence.

### **RATE ESTABLISHED:**

## **COPYIST**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Tracer.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Apprentice Draftsman, Blue Printer.

### **TRADE REQUIREMENTS:**

The Copyist assists the draftsman, by copying drawings, sketches and designs laid down by the draftsman. He should be capable of revising and changing drawings, and be a neat letterer.

### **EDUCATION:**

Trade school, high school, technical school.

### **PHYSICAL REQUIREMENTS:**

Average health; good eyesight.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

He must be able to properly index and file drawings, tracings and drafting room data. Should be somewhat familiar with photography and have had general experience in a drafting room and be familiar with the use of drawing instruments.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **COREMAKER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Molder, Foundry Helper.

### **TRADE REQUIREMENTS:**

The Coremaker makes cores to be used in molds for any class of metal casting. He must be familiar with sands, core compounds and washes.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength above average; should be able to stand heat.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Coremaker must be practically experienced in general iron, brass and steel foundry coremaking, and must have a thorough knowledge of materials, methods and tools of the trade, and must have ability to make up small or large cores of green sand or loam either molded or built up. He should know how to mix and make core stock and be familiar with oven core baking. He should have a thorough experience in a general foundry.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; physical strength; must be at least 18 years of age; should be able to stand heat.

### **RATE ESTABLISHED:**

## COUNTERSINKER

### OTHER NAMES BY WHICH OCCUPATION IS KNOWN:

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### OCCUPATIONS MOST NEARLY ALLIED:

Driller, Reamer, Machinist's Helper.

### TRADE REQUIREMENTS:

The Countersinker, with the use of a pneumatic, steam, or electrically driven drill, bevels the holes in plates or sheets which have been previously punched or drilled in order that the head of the rivet may be made flush with the plate, and that the shank of the rivet when driven may be thickened, assuring greater strength and safety.

### EDUCATION:

Common school, or none.

### PHYSICAL REQUIREMENTS:

Average strength.

### MENTAL REQUIREMENTS:

Average intelligence.

### EXPERIENCE:

Should have had experience operating drill press or automatic air drills; must be familiar with angles at which different holes are countersunk.

### ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:

Average intelligence; common school education.

### RATE ESTABLISHED:



## CRANE OPERATOR

**OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

### Hoist Operator.

**OCCUPATIONS MOST NEARLY ALLIED:**

Derrick Operator, Portable Engine Operator, Browning Hoist Operator, Steam Shovel Operator, Rigging Crane Operator, Stationary Engineer.

**TRADE REQUIREMENTS:**

The Crane Operator runs the traveling, overhead, shop, gantry or electrically operated boom cranes and derricks. He should be familiar with the operation and care of motors, starters, controllers; must be able to make minor repairs to equipment for cranes.

**EDUCATION:**

Common school, or none.

**PHYSICAL REQUIREMENTS:**

Average strength; ability to pass any required examination on eyesight, hearing and general physical condition.

**MENTAL REQUIREMENTS:**

**Average intelligence.**

**EXPERIENCE:**

Experience as an electrician or stationary engineer is desirable; should be familiar with signal code used in the yard; must be particularly careful and alert.

### ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:

**Common school, or none.**

**RATE ESTABLISHED:**

## **CUPOLA TENDER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Furnace Tender, Smelter Furnace Operator, Puddler.

### **TRADE REQUIREMENTS:**

The Cupola Tender cares for the cupola used for the melting of metals in the foundry; lines the furnace with fire brick or clay; assists in the charging and melting; taps the cupola to fill the ladles when the molds are being poured. He must be familiar with the proportions of fuel, iron, flux, etc., used in producing different quantities and different grades of iron.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength, endurance; ability to withstand intense heat; good eyesight.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

The Cupola Tender should have had experience in general foundry work, a thorough knowledge of furnace operation and experience assisting a Cupola Tender.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

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## **CUTTER, OXY-ACETYLENE**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Oxy-acetylene Burner; Oxy-acetylene Operator.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Electric Welder, Oxy-acetylene Welder, Boilermaker, Blacksmith.

### **TRADE REQUIREMENTS:**

He must be thoroughly familiar with the use and operation of autogenous gas cutting torches for any class of manufacturing, repair, demolition or wreck clearing work, and must fully understand transportation and setting up of such apparatus.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average build and strength; steady nerve; should be possessed of good eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience as a boilermaker or boiler shopworker is very desirable. In some plants, the oxy-acetylene operators are recruited from the boilermakers or blacksmiths, in order that they may be utilized for other work when there is no cutting to be done.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average strength and intelligence; must be at least 20 years of age; boiler-shop or blacksmith-shop experience beneficial but not absolutely necessary.

### **RATE ESTABLISHED:**

## **DIESETTER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Machinist, Toolmaker.

### **TRADE REQUIREMENTS:**

He must understand the setting and adjustment of dies for punching, forming or drawing presses and drop hammers; be a skilled operator on all classes of gear, screw and hydraulic presses, and be able to set and adjust all kinds of dies and plates for presses and shears.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be familiar with the use of calipers, micrometers and gauges, also understand the nature of metals and annealing. Experience in cartridge plant, stamping, or sheet metal plant is desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **DIESINKER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Diemaker.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Drillmaker, Tapmaker, Toolmaker, Expert Machinist, Engraver.

### **TRADE REQUIREMENTS:**

The Diesinker makes or sinks any kind of forging or press die for any purpose.

### **EDUCATION:**

Common school, high school, trade school.

### **PHYSICAL REQUIREMENTS:**

Average strength and build.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Should be able to interpret drawings and sketches, figure dimensions, reproduce from samples, or layout and make trimming and shearing dies of all sorts. He must be acquainted with the best drop die practice and able to operate dies for testing; must have a thorough knowledge of all grades of die steels, methods of annealing and hardening, and the materials from which forgings are made. He must be expert in the operation of profilers, milling, grinding, die sinking, and engraving machine; also skilled in the use of chipping and engraving tools; must be able to make the necessary measurements for accurate work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Should be a machinist, toolmaker or engraver.

### **RATE ESTABLISHED:**

## **DRAFTSMAN—(Engineering)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Engine Draftsman.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Mechanical Draftsman.

### **TRADE REQUIREMENTS:**

The Engineering Draftsman draws all plans pertaining to the engine, boiler and power plant equipment.

### **EDUCATION:**

High school, technical school.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Must be thoroughly experienced in mechanical drafting, with special knowledge of general design, and details of marine engines of all types, steam turbines, boilers, pumps, condensers and feed water heaters, piping and auxiliary apparatus; must be familiar with the layouts, supports and operating equipment in ships of different types; must be thoroughly familiar with materials of construction and able to calculate in proportion dimensions of parts, and be skilled in the use of drafting instruments; must be capable of making all sectional drawings of any parts of main power or auxiliary apparatus.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

These men usually are recruited from technical schools, trade schools or colleges.

### **RATE ESTABLISHED:**

## **DRAFTSMAN—(Hull)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Ship Draftsman, Boat Draftsman.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Structural Draftsman.

### **TRADE REQUIREMENTS:**

The Hull Draftsman is required to do all drafting in connection with the design, construction, fabrication and erection of the hull and its related parts.

### **EDUCATION:**

High school, technical school ; should have knowledge of algebra, geometry, trigonometry and logarithms.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Must have a thorough knowledge of the various types of ships, the principal dimensions, lines, structural details, etc., and capable of making all drawings, such as, horizontal, longitudinal, cross sections, deck plans, transverse bulkheads, rigging details, fittings, watertight doors, stern frames, rudder arrangements, airports, etc.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

These men are usually recruited from technical schools, trade schools or colleges.

### **RATE ESTABLISHED:**

## **DRILLER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Driller and Reamer, Driller and Tapper.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Reamer, Countersinker, Machinist's Helper.

### **TRADE REQUIREMENTS:**

The Driller drills and taps all holes that cannot be laid off and drilled or punched before the steel plates or beams are installed on the vessels. He operates a pneumatic, steam or electrical portable drill.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Driller is usually recruited from the machinists' or boiler-makers' helpers; it takes from one to two months to learn to operate properly a drill and to set up and clamp difficult work on the ship. He must be familiar with the different sized drills used, and be able to do reaming, as in the smaller yards the occupations of driller and reamer are usually combined.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence; common school education; should be over 18 years of age.

### **RATE ESTABLISHED:**

## **DRILL PRESS OPERATOR**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Driller, Reamer, Boring Mill Operator, Machine Driller, Machinist (Operator), Machinist's Helper, Boilermaker's Helper.

### **TRADE REQUIREMENTS:**

The Drill Press Operator operates drill presses on all classes of drilling and boring.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He should be experienced in the operation of standard types of vertical, radial and multiple spindle drilling machines and in power feed drills. He must be able to set up and clamp difficult work; able to adjust auxiliary drills and bore, ream or counter-bore straight or inclined holes; must be familiar with the use of high speed drills and understand proper cutting speed for various materials. He must also understand the drawing of a hole as done in drilling.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average intelligence; must be at least 20 years of age.

### **RATE ESTABLISHED:**

## **ELECTRICIAN—(Ship)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Electrical Repairman, Power Plant Electrician, Electrical Wireman, Telephone Repairman, Automobile Electrician.

### **TRADE REQUIREMENTS:**

The Ship Electrician installs and operates electrical equipment of all kinds on ships.

### **EDUCATION:**

Common school, technical or trade school.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Must be a thoroughly experienced Ship Electrician, capable of installing all electrical apparatus according to plans and drawings; must also be capable of installing complete electrical wiring systems used in ship construction for lighting, power, annunciators and all signaling devices; must be thoroughly skilled in watertight conduit work, and the use of various types of marine conduits and wiring equipment of all kinds. He should have a thorough knowledge of the care and operation of generators, motors, searchlights, storage batteries and other auxiliary apparatus; must be capable of locating and repairing all kinds of wiring defects and performing repairs on various types of ship electrical appliances, such as motors, searchlights, cooking ranges, ovens and irons; should have a knowledge of the construction of wireless systems; similar experience on any large passenger, freight or war ship would be beneficial.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school or trade school education; higher than average intelligence.

### **RATE ESTABLISHED:**



## **ELECTROPLATER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Plater, Polisher.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Galvanizer, Pickler, Plate Ware Manufacturer, Plating Shop Worker, Plater and Polisher, Aluminum or Tinware Finisher.

### **TRADE REQUIREMENTS:**

The Electroplater coats fittings, castings, forgings, plates, etc., with zinc, copper, nickel or silver by cold galvanizing processes.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength; freedom from diseases of the skin, nose, throat, lungs, and eyes.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Electroplater must be capable of handling acids and experienced in the mixing of various solutions used in electroplating. He must understand the hanging of articles and anodes with best results; also, the proper current and time for various kinds and grades of work; be familiar with the use and care of buffing and polishing stands, and roughing, polishing, buffing and finishing wheels of various kinds. He should have had all-around experience in a general plating shop.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average strength; average intelligence; must be at least 18 years of age; free from skin diseases, diseases of the nose, throat, lungs and eyes.

### **RATE ESTABLISHED:**

## **ENGINEER—(Locomotive)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Locomotive Fireman, Locomotive Hostler, Stationary Engineer.

### **TRADE REQUIREMENTS:**

The Locomotive Engineer operates the locomotives handling material in and about the shipyards.

### **EDUCATION:**

Common school; must be able to read and write.

### **PHYSICAL REQUIREMENTS:**

Must be physically sound; of average strength and physique; must be able to pass proper examinations as to hearing, vision and color tests; not subject to fits, fainting spells, or trouble of that nature. Men addicted to the use of liquor or drugs should not be employed.

### **MENTAL REQUIREMENTS:**

Should have good judgment; be alert; higher than average intelligence.

### **EXPERIENCE:**

Desirable that he should have experience in railroad service; able to qualify on standard code of signals and rules used on standard American railways.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **ENGINEER—(Marine)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Mechanical Engineer, Marine Engine Draftsman (Grade "A").

### **TRADE REQUIREMENTS:**

He supervises the design, construction and installation of all mechanical elements of ships, marine equipment and docks.

### **EDUCATION:**

Technical school or college graduate, with considerable practical experience.

### **PHYSICAL REQUIREMENTS:**

Average physique.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

He should be a technical engineer with thorough theoretical knowledge of planning and design; inspection and installation of complete power and machinery equipment, including main engine, condensers, pumps, electrical equipment, boilers, pipe system, steering gears on all types of ships, also floating derricks, dry docks, etc.; and be familiar with dock and cargo handling apparatus. He should have knowledge of hull design and construction.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **ENGINEER—(Stationary)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Locomotive Engineer, Fireman (Stationary or Locomotive),  
Portable Engine Operator.

### **TRADE REQUIREMENTS:**

The Stationary Engineer operates stationary engines and boilers, portable or hoisting engines of any type; steam cranes; pile drivers; steam shovels; tractors; pumping and power plants.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength, good hearing and eyesight. Men addicted to the use of liquor or drugs should not be employed.

### **MENTAL REQUIREMENTS:**

Average intelligence, able to pass examination required by the state or local authorities.

### **EXPERIENCE:**

The Stationary Engineer must be experienced in the operation and maintenance of stationary engines, boilers, their appurtenances, and be capable of making the usual running repairs. He must be familiar with air compressors, pumps and other auxiliary apparatus found in steam power plants. He must possess the license required by law.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **ERECTOR—(Ship)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Shipfitter, Crane Rigger, Structural Steel Erector.

### **TRADE REQUIREMENTS:**

The Erector places the various parts of the ship in their proper positions, after they have been fitted up or fabricated in the shed or shop.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

The Ship Erector should understand the work of the bolter-up. He must be familiar with setting columns, beam, girders and other structural parts; also, understand rigging and hoisting equipment.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; should be over 20 years of age; have average strength, agility and intelligence.

### **RATE ESTABLISHED:**

## **FIREMAN—(Locomotive)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Stoker.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Locomotive Fire Cleaner, Hostler, Engine Watcher.

### **TRADE REQUIREMENTS:**

The Locomotive Fireman fires or stokes the industrial or switch locomotives used in shipyards and on construction work.

### **EDUCATION:**

Common school; must be able to read and write.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance; ability to withstand heat; good eyesight. Men addicted to the use of liquor or drugs should not be employed.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Locomotive Fireman is usually recruited from the cinder-pit men or boiler-room laborers. It requires from two to three months to become experienced in the operation and care of boilers. He should be experienced in the operation, care and cleaning of boilers; capable of evenly maintaining the proper steam pressure; have a knowledge of and be experienced in the use of injectors, pressure and water gauges, and appliances. Similar experience in railroad, contract or other industrial work is desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **FIREMAN—(Stationary)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Fireman, Stoker.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Locomotive Fireman, Water Tender, Ashpit Man.

### **TRADE REQUIREMENTS:**

He operates chain grate or automatic stokers, forced and induced draft fans, draft regulators, coal handling equipment and economizers; also, various safety appliances, injectors, feed water heaters, valves and pumps. He must be able to do hand coaling when stokers are not supplied, and should be familiar with modern practices used to avoid the making of black smoke.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He should have had experience in power or steam plant of a central station or other industrial establishment. He should have a knowledge of all mechanical appliances and safety devices necessary to the successful operation of such a plant.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **FLANGE TURNER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Flanger.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Boilermaker, Frame Bender, Anglesmith.

### **TRADE REQUIREMENTS:**

The Flange Turner turns the edges and bends plates, in flanging or forming the sheets used in shipbuilding. The work is usually done on a flanging machine. He must be thoroughly skilled in reading drawings and in the use of templates, form blocks and shapes and in the careful heating of steel plates, using coal, oil or gas furnaces. He must be capable of working by hand either irregular or plane shapes; bevelling, flanging, or forming, either hot or cold.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance; ability to withstand heat; good eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He should have had experience as a boilermaker or boiler shop worker. Experience in the construction of steel passenger or freight cars, tanks, boilers, or anglesmith work would be beneficial.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; at least 18 years of age; strength and endurance; good eyesight; ability to withstand heat.

### **RATE ESTABLISHED:**



## **FORGER—(Drop)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Forging Machine Operator.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Blacksmith, Hammersmith.

### **TRADE REQUIREMENTS:**

He must be capable of operating all kinds of power and drop forge hammers; properly setting up and keeping in good condition all kinds of roughing and finishing dies and trimmers. He must thoroughly understand the heating and working of various grades of steel under all conditions, and have a thorough knowledge of forging and drop hammers in all varieties of work. He should be familiar with the operation of various types of heating furnaces, using coal, coke, gas, or oil as fuel.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance; ability to withstand heat; good eyesight.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

The Drop Forger is a highly trained workman. Several years of experience are required to know the proper heat and the correct manipulation of heated stock on the press or hammer. He should have had similar experience in an industrial or railroad forge shop.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; strength and endurance; good eyesight; higher than average intelligence.

### **RATE ESTABLISHED:**

## **FOUNDRY FOREMAN**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Molder, Patternmaker Foreman.

### **TRADE REQUIREMENTS:**

The Foundry Foreman has general supervision and charge of the operation of the foundry.

### **EDUCATION:**

Common school, trade school.

### **PHYSICAL REQUIREMENTS:**

Average strength; freedom from diseases of the nose, throat and lungs; ability to withstand heat.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be an experienced mold and form maker, familiar with pattern shop practices; experienced in all details of general foundry work; must have had practical experience in green, dry sand and loam molds; be familiar with all up-to-date cupola practices; possess good judgment in laying out work in the foundry according to drawings and understand the proper formulas used in mixing; also, directing, setting up and handling of large flasks; the use of over-head cranes. He must fully understand the proper treatment and care of furnaces, cupola linings and relinings, and have thorough knowledge of core-making, the building up of large and intricate molds; understand the use of sandblasts, tumbling and pickling; should be familiar with approved systems of keeping proper records.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

First-class molder; common or trade school education; physical strength and endurance; ability to withstand heat.

### **RATE ESTABLISHED:**

## FRAME BENDER

### OTHER NAMES BY WHICH OCCUPATION IS KNOWN:

Anglesmith.

### OCCUPATIONS MOST NEARLY ALLIED:

Blacksmith, Furnaceman.

### TRADE REQUIREMENTS:

The Frame Bender uses templates furnished by the mold-loft or lifted from the ship by shipfitters; to bend and weld heavy lengths and heavy angular shapes. He should be a smith pos-sessing skill in bending and welding heavy angular work. He should be acquainted with the proper temperatures for working, and understand the practical action of shapes and plates when heated and cooled, so as to make proper allowances for shrinkage and change of shape when cooling.

### EDUCATION:

Common school.

### PHYSICAL REQUIREMENTS:

Strength and endurance; ability to stand intense heat.

### MENTAL REQUIREMENTS:

Average intelligence.

### EXPERIENCE:

The Frame Bender is a highly trained workman. Several years of experience are necessary to acquire an expert knowledge of the working and heating of steel, shapes and plates. He should be experienced in reading blue prints and mechanical drawings.

### ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:

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### RATE ESTABLISHED:

## **FURNACEMAN**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Annealer, Heat Treater.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Furnace Tender, Heating Furnace Tender, Steel Furnaceman, Malleable Iron Furnaceman, Frame Bender.

### **TRADE REQUIREMENTS:**

The Furnaceman has charge of the operation and care of the various types of annealing and heat treating furnaces, steel castings, forging tools, sheet metal for draw press work, using coke, coal, gas or oil fuel.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance; quickness; ability to stand intense heat; good eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Furnaceman should be capable of maintaining uniform temperatures required for different classes of material and work and have knowledge of the nature of materials, so that he can properly anneal sheet metals, such as steel, brass and copper.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Should be at least 20 years of age; possess strength and endurance; robust stature; good eyesight; capable of withstanding heat.

### **RATE ESTABLISHED:**

## **GALVANIZER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Electroplater, Polisher, Plating Shop Worker.

### **TRADE REQUIREMENTS:**

The Galvanizer covers with a thin coating of zinc, ship-fittings, castings and forgings, in order to prevent corrosion. The work consists of cleaning the parts and then coating them with zinc. After burning off the paint or oil and cleaning with wire brushes, the parts are immersed in tanks containing dilute hydrochloric acid to make them perfectly clean. Then the part is coated with zinc by placing it in a hot zinc solution. The Galvanizer keeps the vat at the right temperature, has the vat properly skimmed, directs the immersion and sees that the coating is complete.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength; freedom from diseases of the skin, nose, throat, lungs and eyes.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Galvanizer should be experienced in handling acids and familiar with the mixing of the various standard vat solutions.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **GEAR CUTTER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Toolmaker, Toolroom Machinist, Milling Machine Operator, Shaper Operator, Slotter Operator.

### **TRADE REQUIREMENTS:**

The Gear Cutter must be familiar with the operation of shapers or milling machine for the manufacture of all kinds of gears; must be able to work to drawings and make calculations required for the layout of blanks and the correct shaping and milling of teeth. Must thoroughly understand the making of all kinds of spur, bevel, helical, spiral or eccentric gears of any material. He must be skilled in the use of calipers, micrometers, gauges, and be able to work to very close dimensions.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength; good eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be experienced in the setting, adjustment and operation of standard types of shapers, milling machines and gear cutters, also familiar with the materials used in the manufacture of gears.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; good eyesight; at least 16 years old.

### **RATE ESTABLISHED:**

## **GLAZIER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Glass Setter.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Painter, Carpenter.

### **TRADE REQUIREMENTS:**

The Glazier cuts and sets window or skylight glass, and does glazing of any character. He must be able to fit and install glass of any description.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be familiar with general glazing, cutting, fitting and setting plain, plate and ornamental glass in wood or metal sash and frames.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **GRINDER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Metal Finisher, Grinding Machine Operator.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Buffer and Polisher, Plater, Grinder, Machinist's Helper.

### **TRADE REQUIREMENTS:**

The Grinder wears down and polishes to a smooth finish metal castings, forgings and machined pieces. He operates the principal types of grinding machines, such as surface, plane, cylindrical and universal.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength; freedom from diseases of the nose, throat and lungs.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience as machinist's helper desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**



## **HAMMERMAN**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Hammer Runner.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Blacksmith's Helper, Forge Shop Helper.

### **TRADE REQUIREMENTS:**

The Hammerman operates the power press or hammer at the direction of the forger.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Hammerman is usually recruited from the blacksmiths' helpers or forge hands; must have some knowledge of blacksmith work and operating machines.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; must be at least 20 years of age; average strength and physique; average intelligence.

### **RATE ESTABLISHED:**

## **HAMMERSMITH**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Heavy Forger.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Blacksmith, Drop Forger.

### **TRADE REQUIREMENTS:**

The Hammersmith supervises the operation of all kinds of work done with power drop hammers and forge presses; heats and hammers into shape from drawings, templates or samples, all heavy shapes or forgings, such as crankshafts, axles, frames, connecting rods and any sort of large forgings. He works on heavy ingots, but occasionally may be required to work on lighter ingots; he should be able to do bending, drawing, upsetting, welding and forming, using coal, coke, gas or oil fires, and be familiar with the various steels. He should be able to direct work of heaters, backhandlers, strikers and helpers.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Should have good eyesight, strength and endurance; ability to stand heat.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

The Hammersmith should be an expert blacksmith and thoroughly experienced in general power hammer work; must be familiar with the operation of all classes of furnaces, and should have had similar experience in a repair shop or industrial plant.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Must be a practical blacksmith; common school or trade school education; be familiar with mechanical drawings and blue prints; strength and endurance; ability to stand intense heat.

### **RATE ESTABLISHED:**

## **HANDYMAN—(Machinist)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Machinist's Helper.

### **TRADE REQUIREMENTS:**

The Handyman is a particularly able helper, who works at the direction of the Machinist.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Should be a particularly able helper with experience along mechanical lines.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **HEATER—(Rivet)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Heater.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Passer.

### **TRADE REQUIREMENTS:**

The Heater heats the rivets used by the riveter, using either coke, coal, gas, or oil furnaces. He must be able to determine when the rivet is heated to the proper temperature. Boys or old men are usually selected for this work.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength, ability to work outdoors in all sorts of weather conditions.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Ability to work in high places is desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education, at least 16 years old.

### **RATE ESTABLISHED:**

## **HOLDER-ON**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Bucker-up.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Boilermaker's Helper, Tankmaker's Helper, Blacksmith's Helper.

### **TRADE REQUIREMENTS:**

The Holder-on holds the rivet solidly in the hole with either a heavy hammer, a "dolly bar," or a pneumatic holding-on hammer while the riveter shapes the opposite end with his riveting hammer.

### **EDUCATION:**

Common school, or none.

### **MENTAL REQUIREMENTS:**

Average strength and endurance; ability to work in high places, which is required in tank, bridge and structural work; must be able to resist the severe strain of riveting.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He should be experienced in the use of hand, compressed air or hydraulic holding-on hammers; should have had experience in structural, plate, tank or boiler shop, or on tank, bridge or steel structural work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; physical strength and endurance.

### **RATE ESTABLISHED:**

## **JOINER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Carpenter, Cabinetmaker, Furnituremaker, Wood Working Machine Operator.

### **TRADE REQUIREMENTS:**

The Joiner works from blue prints, making and installing the wood and cabinet work on the vessel. He must be capable of performing all kinds of wood and assembly work, such as making sashes and window frames, doors and door frames, general house building, wood fixtures, desks, instrument cases, etc.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

He must have experience in reading drawings and sketches, laying out and performing all classes of joining work; must be a competent bench hand with experience in the use of wood-working machines.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average intelligence; average strength.

### **RATE ESTABLISHED:**

## **LABORER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

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### **TRADE REQUIREMENTS:**

The Laborer does general unskilled work or labor of any kind in connection with the various departments of the shipyard.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be able to perform general labor in connection with ship work, excavation, grading, track laying, handling machinery or materials, or in connection with any of the trades.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **LABOR FOREMAN**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Outside Foreman, Yard Foreman, Stevedore Foreman, Roustabout Boss, Section Foreman.

### **OCCUPATIONS MOST NEARLY ALLIED:**

.....

### **TRADE REQUIREMENTS:**

The Labor Foreman oversees the work of the laborers and other unskilled workers in the loading and unloading of material, moving of heavy material, cleaning up the yard and buildings or any other work requiring no special skill.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Labor Foreman must be tactful, resourceful, and experienced in the handling of men, particularly foreigners. He should possess good judgment and balance; experience as a rigger would be beneficial.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**



## **LEAD BURNER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Sheet Lead Worker, Lead Pipe Worker, Plumber, Solderer.

### **TRADE REQUIREMENTS:**

He should be capable of connecting storage batteries, terminals, leads, and making lead-lined tanks, constructing or repairing lead chemical apparatus.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance, as much of the work is overhead and is tiresome unless the Lead Burner is possessed of more than average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be a thoroughly experienced and skilled lead burner, familiar with all classes of lead burning work, especially battery terminals and connections for stationary and storage batteries, lead or lead lined chemical tanks, retorts and apparatus. Experience in storage battery manufacturing plant or chemical works desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **LOAM MIXER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Coremaker's Helper, Molder's Helper.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Laborer.

### **TRADE REQUIREMENTS:**

The Loam Mixer prepares the sand or loam for the cores and molds at the direction of the coremaker or molder.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Loam Mixer is usually recruited from the laboring help in the foundry. The work can be done by boys, or men who are too far advanced in years to do the more strenuous work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **MACHINIST—(General)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

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### **TRADE REQUIREMENTS:**

The General Machinist does any class of general machine work, involving construction, assembly, repair, bench or machine tool work.

### **EDUCATION:**

Common school, trade school.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique; good eyesight.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

He must be experienced in all around general machinist work, including floor, bench and machine work; should be able to work to drawings, figure dimensions and, where required, lay out work; also have experience in the use of portable tools; be able to operate standard machine shop tools, such as lathes, boring mills, planers, shapers, slotters, millers, thread-cutting tools, etc.; must have had experience in chipping, filing, fitting, tapping, reaming, fitting journals and bearings, keysetting, stud and bolt fitting; should understand the use of calipers, micrometers and gauges; also grinding of drills and machine tools.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Must be able to read and write; average strength; good eyesight; must be at least 18 years of age.

### **RATE ESTABLISHED:**

## **MACHINIST—(Classified)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

.....

### **TRADE REQUIREMENTS:**

(See Page 90.)

### **EDUCATION:**

Common school, trade school.

### **PHYSICAL REQUIREMENTS:**

Average strength; endurance; good eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience in general shop desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education, average intelligence, average health;  
at least 18 years of age.

### **RATE ESTABLISHED:**

## **MACHINIST—(Classified)**

**NOTE:** Machinists, as a rule, are divided into the following classes:

### **MACHINIST—ASSEMBLER:**

The Assembler is a machinist who puts together parts that compose a part or all of a machine.

### **MACHINIST—BENCH HAND:**

The Bench Hand Machinist is an all-around machinist; does light and medium bench and assembly work.

### **MACHINIST—BRASS WORKING:**

The Brass Working Machinist makes repairs and erects valves, manifolds, and does general brass shipfitting work.

### **MACHINIST—FITTER:**

The Fitter is a machinist who puts together machine parts and is able to fit, file, scrape and ream where necessary to make the proper mechanical adjustments. He must be able to apply the necessary tests to keep his work in alignment and be able to adjust tight, loose and running fits.

### **MACHINIST—FLOOR HAND:**

The Floor Hand Machinist is a fitter or floor hand, employed on large work, such as engine beds, large pumping machinery, locomotive parts, mining and electrical machinery, etc.; he should be able to read drawings and blueprints. The work requires that he be strong.

### **MACHINIST—LOCOMOTIVE:**

He must be a thoroughly experienced, all-around, skilled, practical machine operator, floorhand and benchhand; must be able to work to drawings; figure dimensions; make sketches; lay out, construct or repair any of the parts of a locomotive; should be familiar with the standard types of valve gears now in use, namely: Stephenson link, Walscheart, Baker-Pilliod, etc., and understand their adjustment; be familiar with auxiliary features, such as air pumps, lubricators, air-brake apparatus, injectors, etc. He must be skilled in chipping, filing, fitting, finishing and assembling; should have had general experience in a locomotive or engine house.

### **MACHINIST—MACHINE HAND:**

The Machine Hand is a machinist who is familiar with the operation of one or more specified machine tools—for example: a lathe hand, shaper hand, slotter hand, planer hand, miller hand, etc., indicates that the machinist bearing this title understands perfectly those individual machines. One machinist often qualifies on several machines. He must read drawings and blueprints, and know the use of tools and instruments used in connection with machine work.

## **MANGLE ROLLER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Roller.

### **TRADE REQUIREMENTS:**

A Mangle Roller operates the machine which straightens the iron or steel plates that pass between the rollers.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience in operating machines in fabricating shop desirable, but not necessary. It requires about one month for the average person to learn to operate a mangle roll successfully.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average physical strength; ordinary intelligence.

### **RATE ESTABLISHED:**

## **MARINE ERECTOR**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Erecting Machinist.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Shipfitter, Machinist, Outside Machinist.

### **TRADE REQUIREMENTS:**

The Marine Erector is a machinist who specializes in the erecting work on the vessel. He is employed in the erection of the vessel, on the installation of the engines, machinery, and other equipment.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength; agility.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Marine Erector must be an all-round erecting machinist; have a thorough knowledge and broad experience in the construction of vessels and installation of machinery and equipment.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average strength; must be at least 20 years of age.

### **RATE ESTABLISHED:**

## **MILLWRIGHT—(General)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Factory Millwright.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Machinist, Carpenter.

### **TRADE REQUIREMENTS:**

He installs and maintains general power and transmission machinery and equipment in shop, plant or factory for any purpose; must be able to install and maintain hangers, shafting, pulleys, belts of all types, machine tools, frames, and general equipment; should be a practical power transmission man, able to lay out and erect stringers, hanger and braces; must be familiar with handling tackle and heavy machinery with the use of jacks, hoists, slings, blocks, skids and cribbing.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength; ability to work overhead.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must have experience in laying out from drawing or sketches, and be familiar with blue prints and mechanical drawings; knowledge of concrete forms, and concrete work desirable. Experience in rolling mill or large manufacturing plant, machine shop or railroad construction work would be beneficial; should understand application and repair of belts.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education, average strength and intelligence.

### **RATE ESTABLISHED:**



## **MOLDER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Coremaker, Foundry Worker.

### **TRADE REQUIREMENTS:**

The Molder makes molds for iron, steel, brass, aluminum and other castings. He understands the material used in this work—that is, sands of various kinds, facings, washes and core compounds; the proper ventilation of molds; making of molds by means of sweeps and other appliances and the coring of molds. He is familiar with the heat value of fuels, melting temperature, and shrinkage of various metals.

### **EDUCATION:**

Common school, trade school.

### **PHYSICAL REQUIREMENTS:**

Physical strength and endurance; ability to stand heat.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be an experienced, practical molder on large and small castings; should be thoroughly experienced in the making, setting, and supporting of cores of all kinds; the proper heating, lifting and handling of molds; should be able to build floor molds, and understand the use of pneumatic hammers; have a knowledge of furnaces, mixtures, and proper casting temperatures for desired results.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; strength and endurance, at least 20 years of age; average intelligence.

### **RATE ESTABLISHED:**

## **MOLD LOFTSMAN.**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Linesman, Developer.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Ship Carpenter, Ship Joiner, Patternmaker, Shipfitter.

### **TRADE REQUIREMENTS:**

Plans of the ship are drawn to small scale in the drafting room. The Loftsmen makes his measurements from these plans and lays off on the mold-loft floor his different lines to the full size of the ship. Templates or molds are then made to conform to these lay-outs, and from them the shapes and plates for the ship are marked for fabrication, shearing, punching, planing, etc.

### **EDUCATION:**

Common school, knowledge of drafting and blue prints.

### **PHYSICAL REQUIREMENTS:**

Good eyesight. The Loftsmen works in a stooping position, and the lines drawn are very fine.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence. Must be able clearly to visualize the relations of the various parts indicated, as ordinarily the Loftsmen does not come in contact with the actual operations after the templates have left the loft.

### **EXPERIENCE:**

The Loftsmen is a planner, not an assembler or a fabricator. He must have a knowledge of the form, location, and use of the various parts of the ship. The Loftsmen is one of the most highly trained and experienced workmen in the shipyard; should be skilled in the use of wood-working tools. Experience as a shipfitter would be beneficial.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Candidates should be young men of higher than average intelligence; at least a common school education; show aptitude for drawing and the use of wood-working tools.

### **RATE ESTABLISHED:**

## **NAVAL ARCHITECT**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Marine Architect.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Marine Engineer, Marine Designer, Mechanical Engineer, Hull Draftsman (Grade "A").

### **TRADE REQUIREMENTS:**

The Naval Architect specializes in plans and designs of construction and repair of steel or wood ships. He is capable of preparing all specifications and contracts, supervising the purchase and inspection of all materials, and is able to act in an advisory and consulting capacity in all matters pertaining to ship construction. He must have a thorough knowledge of the laws of hydrostatics, strength of materials, design of structural steel frames, columns, arches, and roof construction, as related to hulls and the design treatment of interiors. He must be thoroughly familiar with designs and installation of power, heating, ventilating, refrigerating, plumbing and lighting systems as applied to marine service.

### **EDUCATION:**

Technical school or graduate of college engineering course.

### **PHYSICAL REQUIREMENTS:**

Average health and strength.

### **MENTAL REQUIREMENTS:**

Should have exceptional creative ability.

### **EXPERIENCE:**

Should have had experience in connection with shipbuilding plant or steamship operating company.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

The Naval Architect is recruited from colleges or technical schools.

### **RATE ESTABLISHED:**

## **OILER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Lubricator.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Factory Oiler, Millwright's Helper, Machinist's Helper, Handyman, Wiper.

### **TRADE REQUIREMENTS:**

The Oiler lubricates and keeps in first-class running condition all shafting, and bearings of motors, engines, pumps, drop-hammers, turbines, dynamo generators and other machinery of any kind.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be familiar with the various makes and grades of lubricants and their merits with regard to application. He must also be familiar with the treatment of hot bearings.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

.....

### **RATE ESTABLISHED:**

## **PAINT MIXER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Paint Mill Worker.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Dye Plant Worker, Painter.

### **TRADE REQUIREMENTS:**

The Paint Mixer makes and grinds paint and white lead used on the ship. He must be able to run paint mixers of standard makes and sizes, also able to prepare putty, finishes, fillers and stains.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average health and strength; freedom from diseases of the nose, throat and lungs.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Paint Mixer should be familiar with paint making processes; should be familiar with the handling and packing of paints, leads, etc.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average intelligence and strength.

### **RATE ESTABLISHED:**

## **PAINTER—(General)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Sign Painter, House Painter, Automobile Painter, Wagon Painter.

### **TRADE REQUIREMENTS:**

He should have a knowledge of interior and exterior painting; be able to paint or varnish wood, metal or canvas; must be familiar with methods of removing paint, stains or varnish from metal or wood for repainting; also understand the mixing of paints.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique; ability to work on high ladders and scaffolding.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must be experienced in painting large surfaces, and have had practical experience with house or structural painting; be able to match and mix paints; have a knowledge of the care of brushes; be a good rigger and scaffold man.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education, average strength and physique.

### **RATE ESTABLISHED:**

...

## **PASSER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Passer Boy.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Boilermaker's Helper, Riveter, Rivet Heater, Laborer, Holder-on.

### **TRADE REQUIREMENTS:**

The Passer takes the rivet from the heater, and inserts it in the hole preparatory to driving. Old men and boys can be utilized.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and endurance; ability to work in high places.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

No previous experience necessary.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average physical strength and endurance; ability to work in high locations.

### **RATE ESTABLISHED:**

## **PATTERNMAKER—(Metal)**

**OTHER NAMES BY WHICH OCCUPATION IS KNOWN:** .....

**OCCUPATIONS MOST NEARLY ALLIED:** .....

Wood Patternmaker.

### **TRADE REQUIREMENTS:**

The Metal Patternmaker, using master wooden pattern as his copy, files and scrapes, solders and burnishes parts of the casting to be used as a pattern; must be able to work from drawings, sketches, or samples; calculate shrinkage, and be familiar with making and changing metal patterns; should be a good solderer and metal filer.

### **EDUCATION:**

Common school, trade school.

### **PHYSICAL REQUIREMENTS:**

Average physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Should have had experience in pattern shop, factory or foundry.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common or trade school education; ability to read drawings and blue prints; average strength and intelligence.

### **RATE ESTABLISHED:**



## **PATTERNMAKER—(Wood)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Cabinetmaker, Wood Carver, Joiner.

### **TRADE REQUIREMENTS:**

The Wood Patternmaker must be able to construct from drawings given him any object which it is desired to reproduce in iron or other metal to the finished size, making the necessary partings and allowing the proper shrinkage. He must also make the core boxes required for the same.

### **EDUCATION:**

Common school; high school; trade school; capable of reading and interpreting blue prints and mechanical drawings.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Must be a thoroughly experienced Wood Patternmaker on large and small work; should have had experience in general pattern shop, manufacturing plant or foundry; knowledge of foundry practices; must be capable of operating wood-working machinery, such as the joiner, planer, band, jig and circular saws, lathe, disk sanding, and other machinery in the pattern shop. Patternmakers usually learn their trade by serving an apprenticeship.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common, trade or high school education; average physique; higher than average intelligence.

### **RATE ESTABLISHED:**

## **PICKLER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

.....

### **OCCUPATIONS MOST NEARLY ALLIED:**

Galvanizer, Electroplater, Acid Plant Worker.

### **TRADE REQUIREMENTS:**

The Pickler cleans the steel, brass or cast iron parts of scale and impurities as they come from the mill, in preparation for bending, cementing or galvanizing, by standing or suspending them in an acid solution. They are then dipped in lime water, thoroughly washed in clean water and dried.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Must be free from diseases of the nose, throat, lungs and skin; good eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must have a practical knowledge of the method of handling acids, and mixing pickling solutions; must have practical experience in dipping various kinds, sizes and shapes of metal parts, and should be capable of keeping vats and surroundings in good condition.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **PIPE COVERER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Asbestos Worker, Lagging Applier.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Plasterer, Stucco Worker, Cement Worker.

### **TRADE REQUIREMENTS:**

The Pipe Coverer applies insulating coverings to steam pipes, hot and cold water pipes, refrigerating pipes, boilers, tanks, feed water heaters, etc. Magnesia, asbestos, hair, felt, etc., are generally used. Cloth is usually sewed on to the insulation.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience as a plasterer or plasterer's helper is an asset. He must have experience in mixing insulating plaster and the use of trowels for laying and finishing.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average strength and physique.

### **RATE ESTABLISHED:**

## **PIPEFITTER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Steamfitter.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Gasfitter, Plumber.

### **TRADE REQUIREMENTS:**

A Pipefitter bends, taps, cuts and lays or erects pipes, flanges, plugs, etc., either with or without screw fittings in all parts of the ship for all purposes, and in connection with the building work in and around the plant. He uses leads and solders to make watertight connections, cuts and shapes gaskets where needed; also makes watertight bulkhead connections; makes templates where dimensions are omitted from the drawing.

### **EDUCATION:**

Common school; must read and understand mechanical drawings and blue prints.

### **PHYSICAL REQUIREMENTS:**

Average strength; ability to work in changing atmospherical conditions.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience as a plumber, gasfitter or steamfitter is desirable; must be skilled and experienced in all kinds of pipe work, steam, water or air; able to bend pipe and must thoroughly understand the operation of hand and power driven pipe cutting and bending machines, and pipecutters; must have practical knowledge of standard valves and fittings, tank, pump and boiler connections; must be capable of performing tests on completed pipe work under hydrostatic pressure; and have knowledge of leads and acids used in pipe shop work; understand use of wrenches, dies and taps.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence and strength; over 18 years of age; should be free from rheumatism and not subject to colds or bronchial troubles.

### **RATE ESTABLISHED:**

## **PLANER OPERATOR**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Planer.

### **OCCUPATIONS MOST NEARLY ALLIED:**

General Machinist, Shaper Hand, Slotter Hand.

### **TRADE REQUIREMENTS:**

He must be able to operate planers of different makes and sizes; familiar with placing, blocking, bolting, setting, and clamping large or small, heavy or light and springy parts for planing; must be able to work from drawings and sketches; figure the necessary dimensions and lay out work.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength and build.

### **MENTAL REQUIREMENTS:**

Average intelligence; good eyesight.

### **EXPERIENCE:**

Must be experienced in setting tools, for squaring, under-cutting, facing and fitting; in the use of calipers, micrometers and gauges. Experience as planer hand in railway, industrial plant or shipyard is desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average strength and intelligence; good eyesight.

### **RATE ESTABLISHED:**

## **PLANKER—(Wooden Ships)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Trunnel Borer.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Carpenter, Farm Carpenter, Bridge Carpenter, Wooden Dock Builder.

### **TRADE REQUIREMENTS:**

After the frame of the vessel has been placed and the dubbers have smoothed the timbers, the Plankers "stick" the planks on the hull by boring, driving and wedging trunnels, and later fasten the planks with spikes. They also lay the decks, fastening them with bolts, drift pins or screws.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength; ability to work outdoors in changing weather conditions.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The work is usually done by ship carpenters and their apprentices. Experience as a dock builder, bridge builder or on heavy carpenter work is desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **PLATE HANGER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Regulator.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Bolter-up, Holder-on, Fitter.

### **TRADE REQUIREMENTS:**

The Plate Hanger places the plates on the frames of the ship in their proper position, bringing the rivet or bolt holes in line so that the bolter-up will have little or no difficulty in placing his bolts and tightening up.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Plate Hanger should understand the marking or code system used in the yard. Experience as a rigger or bolter-up would be beneficial.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average strength; intelligence; over 20 years of age.

### **RATE ESTABLISHED:**

## **PLUMBER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Steamfitter, Gasfitter, Pipefitter, Lead Calker.

### **TRADE REQUIREMENTS:**

The Plumber fits and installs lead, brass, nickel plated and galvanized pipe for water supply and sanitary systems; should be able to work from templates, drawings and sketches.

### **EDUCATION:**

Common school, or trade school.

### **PHYSICAL REQUIREMENTS:**

Average physical strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must be a practical general plumber, experienced in installing water supply, sanitary plumbing systems and appliances, such as toilets, sinks, drains and waste pipes; must be familiar with general piping and lead pipe work, pipefittings, calking joints and making surface connections; should have knowledge of hot water and steam heating systems.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence; strength.

### **RATE ESTABLISHED:**



## **POWER HOUSE ENGINEER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Chief Engineer.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Plant Engineer, Stationary Engineer, Machinist, Locomotive Engineer, Steam Crane Operator.

### **TRADE REQUIREMENTS:**

The Power House Engineer supervises, and in most cases operates and maintains, the power equipment of the plant, whether it be electric or steam. In the larger plants, where electric power is used, he is sometimes assisted by an electrician.

### **EDUCATION:**

Common school, trade or technical school.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

The Power House Engineer must understand the installation, operation and maintenance of all types of stationary, steam engines, turbines, boilers, pumps, condensers, feed water heaters, air compressors, and methods of storage and handling coal. He must have a thorough knowledge of the operation and control of direct or alternating current generators of high or low tension, switchboards, transformers, with other protective apparatus, etc. He must be capable of making tests of the various machines under his charge. He should have had similar experience as an operating engineer in a similar power plant elsewhere.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **PUNCH PRESS OPERATOR**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Punchman.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Hydraulic Press Operator, Shearman.

### **TRADE REQUIREMENTS:**

He must understand the operation of single or multiple punch presses.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength, average physique.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must be experienced in the operation of power presses, and familiar with setting dies and punches, also be able to keep them in condition; should have had similar experience in stamping works, hardware, or can manufactory.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average strength and physique; average intelligence.

### **RATE ESTABLISHED:**

## **REAMER—(Metal)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Driller, Countersinker, Machinist's Helper, Boilermaker's Helper.

### **TRADE REQUIREMENTS:**

The Reamer enlarges the rivet or bolt holes where they overlap slightly, are not perfectly cylindrical, or where it is desired to enlarge the diameter of the hole, so that the rivet or bolt will completely fill the hole. He operates a pneumatic, steam or electric portable drill.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average physical strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Reamer is usually recruited from the machinists' or boiler-makers' helpers. It takes from one to two months to learn how to properly operate a reamer and to set up and clamp difficult work on the ship. He must be familiar with the different reamers used.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence; common school education; should be over 18 years of age.

### **RATE ESTABLISHED:**

## **REAMER—(Wood)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Beedler.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Rough Carpenter, Wood Calker, Carpenter's Helper.

### **TRADE REQUIREMENTS:**

The Reamer drives with a beedle, a wide flat iron (the horsing iron), into the seams between the planks in the hull and on the deck to open them for the entrance of the oakum filling. He works chiefly on repair jobs.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Any intelligent helper or laborer who has used a hammer can learn the details of reaming in a short time; should be experienced in working in different postures.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **RIGGER—(Crane)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Craneman.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Sailor, Bridge Erector, Steeple Jack, Ship Rigger.

### **TRADE REQUIREMENTS:**

He is a member of the Craneman's group. He attaches ropes or chains to the heavy materials which are to be transported, signals the crane for operation and directs same to location desired.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience as a sailor or ship rigger is desirable, and experience in the use of tackle and derricks would be valuable. The Crane Rigger should have experience as a bridge and structural erecting rigger familiar with handling beams, columns, girders, plates, boilers, castings, etc., and should understand the use of traveling cranes and boom derricks, electric or portable hoisting equipment used in such work; must be familiar with roping and rigging sheaves, blocks, pulleys and guying of poles, booms, tripods and the running and splicing of hemp or steel cables and ropes; must understand lashing, hitching and hooking with loops, wire ropes or chains and be able to handle heavy pieces and raise or lower accurately any erecting work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence, strength and endurance; over 20 years of age.

### **RATE ESTABLISHED:**

## **RIGGER—(Ship)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Marine Rigger.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Sailor, Crane Rigger, Bridge Rigger.

### **TRADE REQUIREMENTS:**

The Ship Rigger sews canvas coverings and splices, serves and fits the wire and manila cable used on the ship. He manufactures and installs the shrouds, stays, lifts, braces, life lines, and other rigging fitted to the masts, spars and booms.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Should be strong limbed, lithe of body, able to climb and work above ground.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience as a sailor is useful, must know how to cut, fit, splice wire and hemp rope; should know the various slings and holds.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence and strength, ability to work above ground.

### **TRADE REQUIREMENTS:**

## **RIVETER—(Hand)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Pneumatic Riveter, Snap Riveter, Bull Riveter.

### **TRADE REQUIREMENTS:**

The Hand Riveter must be able to drive rivets of any size in those parts of the ship not accessible to the pneumatic riveter. He must do water-tight work, and is often called upon to calk and chip his own riveting by hand.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance, ability to work above ground.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Hand Riveter must understand the use of the tools used in hand riveting, chipping and calking; should be experienced in construction and repair work of all kinds on plates, tanks, boilers and structural steel frames. He should likewise understand the heating and setting of rivets.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Strength; preferably over 20 years of age; ability to work above ground.

### **RATE ESTABLISHED:**

## **RIVETER—(Pneumatic)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Rivet Driver, Bull Riveter.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Boilermaker, Structural Steel Worker.

### **TRADE REQUIREMENTS:**

The Riveter drives rivets with an air-hammer. He must be able to drive them rapidly and properly and make them water-tight. He should also be able to do hand riveting.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Physical strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He should be familiar with drilling, reaming, bolting, and understand the care and maintenance of various pneumatic tools.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education, average intelligence.

### **RATE ESTABLISHED:**



## **RIVET MAKER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Rivet Forger.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Bolt Maker, Blacksmith's Helper.

### **TRADE REQUIREMENTS:**

The Rivet Maker sets up and operates a rivet-making machine, which automatically forms the rivet head and cuts the bar into the proper lengths.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Experience as blacksmith's helper or boltmaker desirable.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **ROLLER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Bending Roller.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Machine Operator in fabricating shop.

### **TRADE REQUIREMENTS:**

The Bending Roller operates the roller machine, which bends the steel or iron plates passing through it to the desired curve. The rolls used for diagonal work are operated by the more experienced roller machine operators.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

It requires one to two months' training to operate successfully an ordinary bending roller.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **SAIL MAKER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Canvas Worker.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Tentmaker, Tailor, Awning Maker.

### **TRADE REQUIREMENTS:**

The Sail Maker lays out and makes sails for any kind of water craft. He must be capable of measuring and laying out from drawings all types of sails and skilled in the sewing of the same by hand or machine. He should be able to bind and attach all necessary reefs, rings, and ropes required for the rigging of sails on a ship, also be able to make awnings, coverings, and perform any other work on canvas or other fabric coverings.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be familiar with all grades and weights of canvas and duck; capable of patching and repairing sails and canvas coverings of all kinds, also have a general knowledge of ship rigging.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **SAWYER—(Metal)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Cold Sawyer.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Machine Operator in fabricating shop.

### **TRADE REQUIREMENTS:**

The Sawyer cuts off plates, shapes and frames with a cold circular saw.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average physical strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Any machine operator in fabricating shop should be capable in a short time of operating a cold circular saw.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **SCARFING MACHINE OPERATOR**

### **(Fabricating Shop)**

#### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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#### **OCCUPATIONS MOST NEARLY ALLIED:**

Machine Operator in fabricating shop.

#### **TRADE REQUIREMENTS:**

The Scarfing Machine Operator operates a machine which planes or trims the edges of plates to the layout or design required.

#### **EDUCATION:**

Common school, or none.

#### **PHYSICAL REQUIREMENTS:**

Average strength and endurance.

#### **MENTAL REQUIREMENTS:**

Average intelligence.

#### **EXPERIENCE:**

He should have had experience as a machine operator on some of the machines in the fabricating shop. It would require about one month for a beginner to learn to operate the machine successfully.

#### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average intelligence, strength and endurance.

#### **RATE ESTABLISHED:**

## **SHEARMAN**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Shearer.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Punch Operator, Press Operator, Forging Machine Operator.

### **TRADE REQUIREMENTS:**

The Shearman operates standard makes and types of power-driven bar and plate-shearing machines; must have sufficient mechanical knowledge to set and adjust blades and keep the shearing machine in working condition.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength; robust physique; good eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must be thoroughly experienced in the operation of alligator, vertical or guillotine types of power shears, belt or motor-driven, and in cutting and trimming plates or bars, slabs and billets; must be experienced in working on plates of light or heavy gauge; should be familiar with the use of electric and pneumatic hoists.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **SHEET METAL WORKER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Tinsmith.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Coppersmith.

### **TRADE REQUIREMENTS:**

The Sheet Metal Worker works on sheet metal, usually 1/16" or less, for any purpose; must be able to cut, bend, flange, rivet and solder sheet iron or steel, sheet tin and galvanized iron or brass, aluminum and zinc.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be experienced in all kinds of work on corrugated iron roofs, walls and cornice work; should have had experience on light angles and channels; also, in erecting ventilating equipment and all types of sheet metal work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average strength.

### **RATE ESTABLISHED:**

## **SHIP CARPENTER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Shipwright, Boat Builder (Wood).

### **OCCUPATIONS MOST NEARLY ALLIED:**

Boat Builder, House Carpenter, Dock Builder, Bridge Builder, Stage Builder.

### **TRADE REQUIREMENTS:**

He must be a skilled all around Ship Carpenter and be familiar with the construction of the ship from the laying of the keel until the vessel is finished. The work consists of building foundations, erecting and truing the ways in which the ship is to be constructed, laying keel blocks, setting up shores, setting backings for the riveters, laying wooden decks, installing ceilings, and preparing the ship for launching, laying off and installing deck fittings, gun foundations, auxiliary machinery foundations, etc., and keeping the ship fair upon the ways. He should be capable of bevelling and dubbing. Bevelling is the matching of planking or timbers before they are placed in position on the ship by cutting such material to the proper angle. Dubbing is the trimming done on the planking or timbers after they are placed in position. This work is done with an adz or pneumatic trimmer.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength and endurance, ability to do overhead adz work.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must be capable of keeping the various parts of the ship lined, squared and plumb; must be experienced in the use of carpenters' tools on heavy work; also, in the use of the broadaxe and the adz. Special experience in dubbing or bevelling is desirable. He should be able to read mechanical drawings and blue prints.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; fair strength; average intelligence; over 20 years of age.

### **RATE ESTABLISHED:**



## **SHIPFITTER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Fitter-up.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Sheet Metal Worker, Structural Steel Worker.

### **TRADE REQUIREMENTS:**

He makes templates for plates and shapes which are omitted or changed. He fits these shapes on to the vessel. He fits all metal parts on to the hull of the ship and marks off the angular and cross section plates so that they may be punched and shaped.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Strength.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

The Shipfitter is a planner and assembler. He must be experienced in framing and plate work, and with the operation of a mold-loft; should also be experienced in reading mechanical drawings or blue prints, and in the use of carpenter's tools.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; should be over 20 years of age; average strength; average intelligence.

### **RATE ESTABLISHED:**

## **SPARMAKER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Ship Carpenter.

### **OCCUPATIONS MOST NEARLY ALLIED:**

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### **TRADE REQUIREMENTS:**

The Sparmaker finishes and installs square, octagonal and round spars, masts, cargo booms, etc., and applies the fittings.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength; ability to work out of doors.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Sparmaker is a ship carpenter who specializes in spar-making.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Average intelligence and strength; common school education.

### **RATE ESTABLISHED:**

## **SQUARER—(Wooden Ships)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Ship Carpenter, Carpenter, Farm Carpenter, Dock Builder,  
Bridge Builder.

### **TRADE REQUIREMENTS:**

After the planks have been fastened to the hull, the Squarer follows the plankers and fairs up the surfaces. He uses the adz and the broadax in "cleaning up" the hull.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Health, strength, strong physique, ability to work out of doors in all weather conditions.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Should have experience as dubber and planker.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **STAGE BUILDER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Ship Carpenter, General Carpenter, Farm Carpenter, Bridge Builder, Dock Builder.

### **TRADE REQUIREMENTS:**

The Stage Builder erects staging and scaffolding necessary for the construction of ships and provides stages for the riveters and holders-on, and rigging for supporting holding on machines.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Good health, strength, ability to work out of doors.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Stage Builder is a rough carpenter who has experience in the use of carpenter's tools in heavy work and has some experience in the use of the broadax.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average strength; ordinary intelligence.

### **RATE ESTABLISHED:**

## **STOREKEEPER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Stockkeeper.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Material Checker.

### **TRADE REQUIREMENTS:**

The Storekeeper supervises all materials and the handling of incoming and outgoing stores, keeping a complete and accurate record of all transactions in accordance with the best modern practice; must be capable of allotting the storage space, distributing materials with proper regard to demand and accessibility; clearly marking and labelling all bins and receptacles and be able to maintain and properly handle stores; must be familiar with the names of all parts kept in stock and possess special knowledge of the materials handled.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Should be familiar with the materials used in the different departments of the shipyard, keeping records of maximum and minimum stock requirements, using requisitions on purchasing department and all details; the keeping of stock books, store ledgers, orders and inventories, etc.; should have had experience as a storekeeper in some large establishment.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **STRAPPER—(Wooden Ships)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Ship Carpenter, Carpenter, Farm Carpenter, Bridge Builder, Dock Builder.

### **TRADE REQUIREMENTS:**

The Strapper ties frames of a vessel together by the application of steel or iron straps diagonally across the frames. These straps are set in, so that the face of the strap comes flush with the face of the frame.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength, endurance, agility; ability to work out of doors.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Strapper is usually a rough carpenter who can use the ax, broadax, adz and hatchet and understands bolting; should have experience as a ship carpenter and be able to use the adz in overhead work; also, be familiar with the use of pneumatic drills and hammers. These tools are used extensively in this work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **TANK TESTER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Boilermaker, Boiler Inspector, Tank Builder, Steel Riveter, Steel Chipper and Calker.

### **TRADE REQUIREMENTS:**

The Tank Tester inspects tanks for water and oil tightness. He cuts, chips, splits, files and calks angles, seams and rivets. He tests by sounding with a light hammer to detect looseness in plates and uses a thin-bladed knife called a "feeler knife" to test closeness of joints, and repairs the defects found.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average health and strength; good hearing and eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

The Tank Tester should be an expert chipper, calker and riveter.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school education; average intelligence.

### **RATE ESTABLISHED:**

# **TOOLMAKER**

## **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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## **OCCUPATIONS MOST NEARLY ALLIED:**

Machinist, Lathe, Milling Machine, Shaper, or Grinder Hand.

## **TRADE REQUIREMENTS:**

He must be familiar with interpreting intricate drawings or sketches; able to figure dimensions and work from samples or general instructions; lay out and make gauges, jigs, templates, taps, dies and reamers; must possess thorough knowledge of clearances and temperature allowances; be familiar with materials, the annealing machine, the hardening of tool and die steel, and case hardening of machine steel; should be a skilled operator of the toolroom lathe, milling machine, profiler, shaper, drill press and plane, surface and universal grinders; must be expert on filing, scraping and general hand work.

## **EDUCATION:**

Common school; trade school.

## **PHYSICAL REQUIREMENTS:**

Average strength; good eyesight; freedom from diseases of the nose, throat and lungs.

## **MENTAL REQUIREMENTS:**

Higher than average intelligence.

## **EXPERIENCE:**

The Toolmaker is usually recruited from the ranks of the machinists and must be thoroughly experienced and expert in making tools, gauges and fixtures of all kinds; should have extensive experience as a toolroom machinist in a toolshop or toolroom of a modern shop or machinery manufacturing plant.

## **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

He must be a first-class machinist, with a common school or trade school education, good eyesight, average health and strength; able to read blue prints and mechanical drawings.

## **RATE ESTABLISHED:**



## **TOOLSMITH**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Tool Dresser.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Blacksmith.

### **TRADE REQUIREMENTS:**

The Toolsmith forms, dresses and hardens cutting tools of all kinds, principally drills, chisels, bars, cutters, flue tools, calking and beading tools, lathe and machine tools of all kinds.

### **EDUCATION:**

Common school, or none.

### **PHYSICAL REQUIREMENTS:**

Average strength ; good eyesight.

### **MENTAL REQUIREMENTS:**

Higher than ordinary intelligence.

### **EXPERIENCE:**

The Toolsmith is a highly skilled workman. He must be experienced in shaping and hardening various kinds of high speed steel and carbon steel, have a thorough knowledge of heating and tempering furnaces ; annealing ; also oil and water tempering and air hardening ; should have had similar experience in a machine shop and be experienced in reading and interpreting blue prints and mechanical drawings.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Common school, trade school education ; average strength and intelligence ; good eyesight ; ability to read mechanical drawings and blue prints.

### **RATE ESTABLISHED:**

## **VARNISHER—(Wood and Metal)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Hardwood Finisher, Wood Polisher.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Painter.

### **TRADE REQUIREMENTS:**

He prepares the surface of the wood and metal furniture and fittings used on the ship, in the shop, or office, applying stain, shellac, varnish or other substance, using sandpaper, steel wool, pumice, rotten stone, etc., in the process.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average physical strength; freedom from bronchial trouble.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Expert painter, familiar with the mixing of pigments, oils, dryers, stains and varnishes, etc.; should know the nature of various woods.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

Painter.

### **RATE ESTABLISHED:**

## **WATER TENDER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Pumper.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Locomotive Fireman, Stationary Fireman, Engine Watchman,  
Locomotive Hostler.

### **TRADE REQUIREMENTS:**

The Water Tender controls the water supply to the boilers.

### **EDUCATION:**

Common school ; must be able to read and write. This is required  
by law in some states.

### **PHYSICAL REQUIREMENTS:**

Average strength ; good eyesight and hearing. Men addicted to  
the use of liquor or drugs should not be employed.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He should have experience as a locomotive or stationary fireman,  
with a knowledge of boiler room appliances and methods and  
be capable of taking charge of the fireroom.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **WELDER—(Electric Arc)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Electric Spot Welder, Thermit Welder, Oxy-acetylene Welder.

### **TRADE REQUIREMENTS:**

The Electric Arc Welder fuses and builds up steel, cast iron, bronze, aluminum. In welding with the electric arc welder, one electrode is put in contact with the parts to be welded, while the other electrode is placed sufficiently close to cause an electric arc, and from this the metal parts are brought to a welding temperature. The electrode is then slowly passed along until the whole length is welded.

### **EDUCATION:**

Common school; ability to read blue prints.

### **PHYSICAL REQUIREMENTS:**

Average strength; good eyesight. (It is necessary to wear goggles while welding.)

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Experience in a boiler shop is an asset. He should also understand the fusing of metals and the construction, use and care of the welding apparatus and be able to set it up and connect it to service mains; should understand cleaning, making ready and clamping to insure correct form and solid work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **WELDER—(Electric Spot)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Oxy-acetylene Welder and Cutter, Thermit Welder, Electric Arc Welder.

### **TRADE REQUIREMENTS:**

The Electric Spot Welder fuses together sheet metal or plate work. He accomplishes what a riveter does. Pieces that are to be welded together are placed between the electrodes of the welding machine. The jaws are then clamped and the current turned on. The metal at the point of contact comes to a welding temperature, upon which the pieces of metal are forced together, making a weld at the spot; hence the name of spot welder.

### **EDUCATION:**

Common school; ability to read blue prints.

### **PHYSICAL REQUIREMENTS:**

Average health; strength; good eyesight.

### **MENTAL REQUIREMENTS:**

Higher than average intelligence.

### **EXPERIENCE:**

Must be experienced in welding and have knowledge of electric wiring and welder construction and be able to care properly for the welding apparatus; should be able to form, set and adjust contacts, brackets and supports for any variety of work and fully understand rapid and correct methods of handling to insure positive welding of simple or intricate pieces.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **WELDER—(Oxy-Acetylene)**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Oxy-acetylene Burner, Electric Welder, Thermit Welder.

### **TRADE REQUIREMENTS:**

He must be thoroughly familiar with the use and operation of autogenous, gas-cutting torches, for any class of manufacturing, repair demolition or wreck-clearing work, and must fully understand transportation and setting up of such apparatus. He must be able to weld, patch or build up steel, cast iron, bronze and aluminum; should understand frame, tank and cylinder welding, also understand pre-heating, blocking up, holding and clamping, in order to maintain location and alignment; must have a practical knowledge in cutting "I" beams, channels, plates and hulls in boiler or structural shapes.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average build and strength; steady nerve; good eyesight.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must be thoroughly experienced in the apparatus and processes employed and in the planning and handling of all forms of gas welding for manufacturing, shop or emergency repair work. Experience as a boilermaker, or boilershop worker is very desirable. In some small plants the oxy-acetylene operators are recruited from the boilermakers or iron workers, in order that they may be utilized for other work when there is no welding or cutting to be done. He should also be able to do oxy-acetylene burning or cutting.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **WOOD-WORKING MACHINE OPERATOR**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

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### **OCCUPATIONS MOST NEARLY ALLIED:**

Cabinetmaker, Carpenter, Planing Mill Worker, Joiner.

### **TRADE REQUIREMENTS:**

The Wood-working Machine Operator operates the power-driven wood-working machine tools found in a well-equipped cabinet, joiner or carpenter shop. He forms wooden pieces according to the layout of the binder or other standard templates and jigs. He operates any of the following machines: planer, mortising machine, band, circular and swing saws, joiners, edgers, shapers, molders, lathes and all other power-driven, wood-working machine tools.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

Average strength; good eyesight; freedom from diseases of the nose, throat and lungs.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

He must be an experienced mechanic, able to do shaping, also adjust and operate wood-working tools. It requires about six months to become an expert in the operation of wood-working machines.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**

## **YARDMASTER**

### **OTHER NAMES BY WHICH OCCUPATION IS KNOWN:**

Railroad Yardmaster.

### **OCCUPATIONS MOST NEARLY ALLIED:**

Railroad Conductor, Railroad Brakeman, Switchman.

### **TRADE REQUIREMENTS:**

The Yardmaster oversees the operation and moving of locomotives and trains in the shipyard; oversees the carrying and handling of material about the yard. He directs the operation of electric and steam locomotives and cranes.

### **EDUCATION:**

Common school.

### **PHYSICAL REQUIREMENTS:**

He must be able to pass any required examination on eyesight, and hearing, also color tests.

### **MENTAL REQUIREMENTS:**

Average intelligence.

### **EXPERIENCE:**

Must be familiar with signals and operating rules employed in standard American railroad practice, also conversant with safety rules and requirements employed in this class of work.

### **ENTRANCE REQUIREMENTS FOR TRAINING SCHOOL:**

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### **RATE ESTABLISHED:**





## GLOSSARY OF TERMS USED IN DESCRIPTION OF OCCUPATIONS

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**AIRPORT** (*Hull Draftsman*)—An opening in the ship's side, house, or cabin to admit light or air (usually round in shape and fitted with removable, swinging covers of heavily framed plate glass).

**ANNEALING** (*Diesetter, Furnaceman, Toolsmith*)—Process of treating metal by heat, for the purpose of softening it sufficiently to be machined or worked.

**ANNUNCIATOR** (*Electrician*)—An automatic device operated either by electricity or compressed air for showing or calling numbers, names, etc., at a given signal.

**ANODE** (*Electroplater*)—In electroplating, the anode is the pole or point at which the reserve metal is placed to be broken down and thus maintain the strength of the plating solution.

**APPLIED MATHEMATICS** (*Boiler Layout Man*)—Mathematics as used in the practical work of physics, mechanics, etc.

**AUTOGENOUS** (*Cutter, Welder*)—A process of welding, cutting or soldering by application of intense gaseous or electrical heat.

**AUXILIARY APPARATUS, OR AUXILIARIES** (*Engineering Draftsman, Electrician*)—All winches, capstans, pumps, fans, generators, motors, small engines, and other mechanical equipment on shipboard, except the main engines and boilers.

**BEADING TOOL** (*Toolsmith*)—A tool for forming beads on flues; used by boilermakers.

**BINDER** (*Wood-working Machine Operator*)—A form of template or pattern; is generally in use where a large number of pieces are required having the same size and design.

**BITUMINOUS** (*Bitumastic Painter*)—Pertaining to a composition containing bitumen, which is any native mixture of hydrocarbons saturated with oxygen, especially asphalt.

**BOILER STAY** (*Boiler Inspector*)—A rod or plate joining two parts of a steam boiler at an angle and holding them in position.

**BOOM** (*Sparmaker*)—A stout pole or spar pivoted at one end and used for hoisting; or a spar used to stretch the foot of a fore-and-aft sail.

**BRAZING** (*Coppersmith*)—Process of joining metals by the use of a hard solder, which is composed of equal parts of zinc and brass, and which is commercially known as spelter.

**BULKHEAD** (*Hull Draftsman*)—A vertical partition in a vessel, corresponding to the partition walls in a building, and used to separate parts of the hold into watertight compartments. Bulkheads running athwartships are called "transverse"; those running fore and aft are called "longitudinal."

**BULKHEAD STAPLES** (*Anglesmith*)—Collars, forged from angle bars, to fit around continuous members, passing through bulkheads and making them watertight.

**CALK** (*Calker*)—To make seams and joints watertight or oiltight; in wooden ships by use of oakum; in steel ships by battering down the rivets, or edges of plate.

**CHANNEL BEAMS** (*Sheet Metal Worker*)—Steel girders which in cross-section would appear as an "I" beam with flanges on one side only.

**CORE** (*Coremaker*)—A solid form, placed in a mold, about which molten metal is poured to provide the necessary open spaces in a casting.

**CRIBBING** (*Millwright—General*)—Foundation work usually built up of alternate layers of timbers and boards laid at right angles to one another.

**DOLLY BAR** (*Holder-on*)—A short bar of heavy steel to hold against a rivet to give backing when riveting.

**DRIFT-PIN** (*Bolter-up*)—A piece of round tapered steel used for drawing adjoining parts on steel ships so that rivet holes come fair; used on wooden ships for backing out bolts or treenails.

**DUB** (*Ship Carpenter*)—To dress or smooth wood surfaces anywhere on the ship by means of an adz; to cut fair with an adz.

**ELECTRODE** (*Welder—Electric Arc and Electric Spot*)—Either of the two poles of an electric welding outfit; that portion which comes in contact with the metal to be welded.

**FABRICATOR** (*Mold Loftsmen*)—One who combines the parts or elements of a steel ship; an assembler.

**FAIR** (*Squarer*)—To make smooth, removing any irregularity.

**FLUE TOOLS** (*Toolsmith*)—Tools used in the installation or maintenance of boiler flues—as beading tools, calking tools, etc.

**FLUX** (*Cupola Tender*)—Any alkali or other substance used to aid the fusion of minerals or metals.

**GANTRY** (*Crane Operator*)—The frame of a traveling crane; the crane and framework as a whole.

**GASKET** (*Pipefitter*)—A ring-shaped packing-piece of leather, rubber, canvas, metal, composition, or other substance used between surfaces to render joints water-tight.

**GUILLOTINE POWER SHEARS** (*Shearman*)—A machine which operates on a principle similar to the old French guillotine and used in the plate shop in shearing or cutting off plates.

**GUY** (*Rigger—Crane*)—To support, temporarily or permanently, masts, frames, etc., by means of rope, wire, or sometimes poles.

**HANGER** (*Millwright*)—The frame which holds the bearings for a shaft.

**HEAT TREATMENT** (*Blacksmith*)—A process of securing the desired hardness of steel by means of heating and cooling.

**HYDROSTATICS** (*Naval Architect*)—The science which treats of the equilibrium and compressibility of water, mercury, and similar liquids.

**"I" BEAM** (*Welder*)—A steel girder, the cross-section of which is the shape of a capital "I."

**JIG** (*Wood-working Machine Operator*)—A device for holding materials in position and guiding tools to insure duplication of pattern.

**LAGGING APPLIER** (*Pipe Coverer*)—One who places a non-heat-conducting substance on boilers, etc.

**LAYOUT** (*Mold Loftsman, Wood-working Machine Operator*)—General arrangements; the plan or method of procedure.

**LAYS OUT** (*Boiler Layout Man, Sail Maker*)—Drawing a design on the material which is to be cut or worked or from which a template is to be made.

**LIFTS** (*Rigger*)—Rope supports extending from a mast head to the end of a yard arm; a mechanical hoisting apparatus.

**LOCOMOTIVE HOSTLER** (*Engineer—Locomotive*)—A man who cares for locomotives between trips and prepares them for their succeeding trips.

**MICROMETER** (*Planer Operator*)—Caliper or gauge equipped with a micrometer screw and used for making fine measurements— $\frac{1}{1000}$ " or less.

**MOLD** (*Loam Mixer, Coremaker*)—The mold results from extracting the pattern from the sand and placing the core. In the open space between core and mold the molten metal is poured, which, when cool and cleaned, results in the finished casting.

**MOLD LOFT** (*Mold Loftsman, Shipfitter*)—A shed or building with large, smooth floor, on which the lines of a ship are drawn to full scale for the purpose of making templates.

